

Translation

PATENT COOPERATION TREATY

PCT/EP2003/009426



PCT

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A 54 639 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/009426	International filing date (day/month/year) 26 August 2003 (26.08.2003)	Priority date (day/month/year) 09 September 2002 (09.09.2002)
International Patent Classification (IPC) or national classification and IPC B23B 51/04		
Applicant KOMET GROUP HOLDING GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>10</u> sheets, including this cover sheet. <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of <u>12</u> sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input checked="" type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 06 February 2004 (06.02.2004)	Date of completion of this report 20 January 2005 (20.01.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/009426

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages 1-14, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of 01 2005 (01.61.2005)
- ☒ the drawings:
pages 1-14-14/14, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/009426

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 20-24

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 20-24

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/009426

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
- ☒ the parts relating to claims Nos. 1-19, 25-61

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX IV.3**Lack of unity of invention**

The International Searching Authority has determined that this international application contains multiple (groups of) inventions which are not linked by a single general inventive concept (PCT Rule 13.1), as follows:

I: Claims 1-19, 25-61:

drilling tool with interchangeable cutting inserts, and interchangeable cutting insert whose flanks are divided by an apex line into a guide bevel and a radial outer zone.

II: Claims 20-24 (corresponding to the originally submitted claims 23-27):

drilling tool with interchangeable cutting inserts, in which a flute-like gap is formed by a chamfer at the transition zone between the locating and bearing surfaces of the interchangeable cutting insert on the one hand and the complementary fitting surfaces of the insert seat on the other hand, a cooling lubricant channel opening into the gap.

Reasoned statement:

The search yielded the following prior art document relevant to the assessment of unity of invention:

D1: EP-A2-0 240 759.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX IV.3

That document shows a drilling tool with two insert seats arranged in the zone of the tip (see figures 1, 2 and 5) and interchangeable cutting inserts set therein (see figures 3-5) having major cutting edges (37) and a chisel edge (38) with a central gap. Each of the flanks of the interchangeable cutting inserts is divided by an apex line which starts at the beginning (between 37 and 38) of the central part of the cutting edge, which is angled in the top view of the flank, into a radial outwardly sloping surface, and into a "guide bevel" which slopes radially inward towards the central insert corner (see figure 4).

Invention I:

A comparison of claims 1, 2 and 46 with the citation shows that the following features make a contribution over the prior art and therefore can be regarded as special technical features under PCT Rule 13.2:

the apex line (54) starts at a position inside the central cutter part. According to the preamble, the central cutter part is angled.

Independent claim 38 does not contain any indication that further restricts the central cutter part of the interchangeable cutting insert to an angled cutting zone. According to the present wording of claim 38, document D1 thus discloses an apex line which starts at a position inside the central cutter part, if the chisel edge (38) and the immediately adjacent part of the major cutting

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX IV.3

edge (37) are understood to form in D1 the central cutter part.

The following features of claim 38 thus make a contribution over the prior art and can be regarded as special technical features under PCT Rule 13.2:

the central cutter part and the opposite insert edge towards which the apex line extends intersect at the inner insert corner.

Invention II:

A comparison of claim 20 with the citation shows that the following features make a contribution over the prior art and therefore can be regarded as special technical features under PCT Rule 13.2:

locating and bearing surfaces of the indexable inserts are connected by a bearing chamfer which forms a flute-like gap with the fitting surfaces of the insert seat, a cooling channel to which lubricant is applied opening into the gap.

Consequently, there are no "the same or corresponding special technical features" in said groups of claims, which thus contravene PCT Rule 13.2.

Unity of invention could be established if a technical relationship involving one or more of the same or corresponding special technical features existed between

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX IV.3

these inventions, since a hitherto unrecognised technical problem was solved.

The special features of invention I can be considered to solve the problem of reducing the risk of fracture of the cutters while improving the guidance properties of the drilling tools.

The special features of invention II can be considered to solve the problem of improving cooling and chip removal.

These problems differ from one another or are known in the prior art.

Consequently, said groups of claims lack unity of invention both with regard to the special technical features and with regard to their effects or problems addressed.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-19, 25-61	YES
	Claims		NO
Inventive step (IS)	Claims	1-19, 25-37, 46-61	YES
	Claims	38-45	NO
Industrial applicability (IA)	Claims	1-19, 25-61	YES
	Claims		NO

2. Citations and explanations**1. Observation:**

Claims 20-24 have not been the object of substantive examination because no search report was established for these claims, on the grounds of lack of unity of invention (see Box IV).

2. This report also makes reference to the following documents:

- D1: EP-A-0 240 759 (GUEHRING GOTTLIEB FA), 14 October 1987 (1987-10-14)
- D2: US-A-5 800 100 (KRENZER ULRICH), 1 September 1998 (1998-09-01)
- D3: DE 100 30 297 A (KOMET PRAEZ SWERKZEUGE ROBERT), 10 January 2002 (2002-01-10)
- D4: GB-A-2 016 316 (KOMET STAHLHALTER WERKZEUG), 26 September 1979 (1979-09-26)
- D5: WO 01/85375 A (KOMET PRAEZ SWERKZEUGE ROBERT; THEODOROU MILTIADIS (DE); MORLOK HE), 15 November 2001 (2001-11-15)
- D6: US-A-5 695 303 (BOIANJIU GIDEON ET AL), 9 December 1997 (1997-12-09)
- D7: EP-A-0 491 670 (SANDVIK AB), 24 June 1996 (1992-06-04)

3. Document D1 is considered to constitute the prior art closest to the subject matter of claims 1, 2, 38 and 46, and discloses, with reference to claim 1 (the references in parentheses are to that document):

a drilling tool with a base body rotatable about a drilling axis (A), two insert seats (14, 15) arranged in the zone of the tip of the base body and interchangeable cutting inserts (27, 28) which can be removably inserted into the insert seats (14, 15) and face one another at a central insert corner over the drilling axis (A), leaving a central gap (see figure 3). Each of the interchangeable cutting inserts (27, 28) has a major cutting edge (37) which extends from a radial outer guide bevel (reference number 36 in figure 3) to the central insert corner, as well as a face and a flank that meet in the zone of the major cutting edge (37), forming a cutting wedge. The major cutting edges (37) of the interchangeable cutting inserts (27, 28) complement each other in the area of a **central angled** cutter part (38), forming a chisel edge interrupted by the central gap. The interchangeable cutting inserts (27, 28) have on their flank a guide bevel which extends from an apex line (see figures 3 and 4) which starts in the zone of the central cutter part (38) to the central insert corner. In their radially outer zone, the flanks are positively inclined, complementing each other in an arrow-like manner in the advance direction, and in the area of their guide bevels, they are negatively inclined, complementing each other in the advance direction in a funnel-like manner facing the central gap (see, in

particular, figure 4). The interchangeable cutting inserts have a bearing surface away from their flank and a through-opening (35) which extends through the flank and the bearing surface to receive a fastening member, and the guide bevels are inclined towards the respective bearing surface.

- 3.1 The subject matter of claim 1 thus differs from the known drilling tool in that the apex line (54) starts at a position inside the central cutter part. According to the preamble, the central cutter part is angled. The subject matter of claim 1 is therefore novel (PCT Article 33(2)).
- 3.2 The problem addressed can be considered to be that of reducing the risk of fracture of the cutters, while improving the guidance properties of the drilling tool.
- 3.3 The prior art does not suggest arranging the apex line as defined in claim 1. The solution to this problem, as proposed in claim 1 of the present application, therefore involves an inventive step (PCT Article 33(3)).
4. The drilling tool as per claim 2 and the interchangeable cutting insert as per claim 46 also differ from the closest prior art document D1 in that the apex line starts at a position inside the central cutter part. According to the preamble, the central cutter part is also angled.

Claims 2 and 46 therefore also meet the requirements of PCT Article 33(2) and 33(3) for novelty and inventive step, for the same reasons mentioned with

regard to claim 1.

5. Dependent claims 3-19, 25-37 and 47-61, insofar as they are dependent on claims 1, 2 and 46, respectively, also meet the PCT novelty and inventive step requirements.
6. Independent claim 38 does not contain any indications which would further restrict the central cutter part of the interchangeable cutting inserts to an angled cutter zone.

According to the present wording of claim 38, document D1 discloses an apex line which starts at a position inside a central cutter part, if the chisel edge (38) in D1 and the immediately adjacent part of the major cutting edge (37) are understood to constitute a central cutter part.

- 6.1 Consequently, the following features make a contribution over the prior art (PCT Article 33(2)):

the central cutter part and the opposite insert edge, towards which the apex line extends, intersect at the inner insert corner.

- 6.2 This apex configuration produces a triangular guide surface. In view of figures 3 and 5 of document D1, however, this feature is necessarily obtained if the shape and geometrical dimensions of the cutting insert or the chisel edge angle are slightly modified, without thereby solving a special problem.

The subject matter of claim 38 therefore does not meet the requirements of PCT Article 33(1) because

it does not involve an inventive step (PCT Article 33(3)).

- 6.3 In view of documents D1-D7 (see the corresponding figures and text passages cited in the search report), dependent claims 39-45 do not contain any features which, in combination with the features of any claim to which they refer, meet the PCT novelty and inventive step requirements.

They relate to typical structural measures which are well known to a person skilled in the art and which he would readily consider during his normal trade practice. If only to ensure a defined location and ease of handling, a person skilled in the art would already provide corresponding bevels and curvatures at the corresponding edges, according to the circumstances.

Document D2 also contains indications regarding the design of the vertical angle (see column 6, lines 40-44) and face inclination. Document D4 shows corresponding funnel angles in figure 5.